

Claims

1. A method for producing a shaped layered composite comprising an interface defined by melt-lamination of overlapping flow streams, wherein said interface lies  
5 generally in an x-z plane of an x-y-z coordinate system in which the x-axis defines a transverse dimension of said interface and the y-axis extends generally perpendicularly through said interface, said method comprising  
10 with a first shaped flow stream and a second shaped flow stream each having a main flow direction generally in the z-direction, and said first shaped flow stream and said second shaped flow stream being suitably shaped for melt-lamination, changing the relative orientation of said first  
15 shaped flow stream to said second shaped flow stream from a generally side-by-side orientation along said x-axis to a generally stacked orientation in which said first shaped flow stream defines a first plane and said second shaped flow stream defines a second plane along said y-axis,  
20 thereafter forming said interface of said shaped layered composite by melt-laminating said first shaped flow stream and said second shaped flow stream, wherein said layered composite is formed independent of division of a layered precursor stream, and  
25 thereafter dimensionally increasing said interface along said x-axis to form a multilayered composite product of greater width than thickness, wherein said interface is generally parallel to said width.
2. The method of claim 1, wherein said first shaped flow stream and said second shaped flow stream are co-  
30 planar to one another in said generally side-by-side orientation.
3. The method of claim 1, wherein said first shaped flow stream and said second shaped flow stream are in  
35 different planes from one another in said generally side-by-side orientation.

4. The method of claim 1, wherein said first shaped flow stream and second shaped flow stream are layered streams, and said first shaped flow stream differs from said second shaped flow stream in layer sequencing, but the streams merged to form said first shaped flow stream are of the same composition as the streams merged to form said second shaped flow stream.

5. The method of claim 1, wherein said first shaped flow stream and said second shaped flow stream are layered streams, and said first shaped flow stream differs from said second shaped flow stream in layer sequencing, and at least one of the streams merged to form said first shaped flow stream differs in composition from each of the streams merged to form said second shaped flow stream.

6. The method of claim 1, wherein said first shaped flow stream and said second shaped flow stream are layered streams, and said first shaped flow stream and said second shaped flow stream have identical layer sequencing.

7. The method of claim 1, wherein said first shaped stream flow stream or said second shaped flow stream is a layered stream and during the step of forming said first shaped stream or said second shaped stream, there is a substantial difference in the volumetric or mass flow rates of at least two of the streams being merged.

8. The method of claim 1, wherein during the step of forming said shaped layered composite, there is a substantial difference in the volumetric or mass flow rate of said first shaped flow stream compared to said second shaped flow stream.

9. The method of claim 1, wherein said first shaped flow stream is a layered stream comprising at least one interface having a width  $w$ , and at least two of the streams merged to form first shaped flow stream have said width  $w$ , and wherein said second shaped flow stream is a layered stream comprising at least one interface having a width  $w'$ ,

and at least two of the streams merged to form said second shaped flow stream have said width  $w'$ .

10. Apparatus for producing a multilayered composite product comprising a coextrusion structure and a partition member, wherein said coextrusion structure is partitioned by said partition member into a first coextrusion substructure and a second coextrusion substructure, wherein said first coextrusion substructure comprises a first flow-shaping channel in fluid communication with a first flow convergence channel, and said partition member forms a wall portion of said first flow-shaping channel, and wherein said second coextrusion substructure comprises a second flow convergence channel.

11. The apparatus of claim 10, wherein said second coextrusion substructure comprises a second flow-shaping channel and a third flow-shaping channel in fluid communication with said second flow convergence channel, and said partition member also forms a wall portion of said second flow-shaping channel.

12. The apparatus of claim 11, wherein said wall portion of said first flow-shaping channel and said wall portion of said second flow-shaping channel are arranged to form a stream-dividing wall.

13. The apparatus of claim 10, wherein said partition member is a plate, said first coextrusion substructure further comprises a first flow-shaping insert that comprises a transverse flow-providing portion of said first flow-shaping channel, and said plate and said first flow-shaping insert are individually removably disposed within said apparatus.

14. The apparatus of claim 10, further comprising downstream of and in fluid communication with said coextrusion structure, removably disposed means for changing the relative orientation of a first flow stream and of a second flow stream to one another, comprising

inlets disposed generally side-by-side to a first flow-sequencing channel and a second flow-sequencing channel in fluid communication with an interface generating channel.

15. The apparatus of claim 14, wherein said inlets are  
5 disposed coplanar to one another.

16. Apparatus for producing a multilayered composite product comprising a first flow-shaping structure, a first flow-shaping channel in fluid communication with a flow convergence channel, and a partition member, wherein said  
10 first flow-shaping structure is partitioned by said partition member so as to comprise a second flow-shaping channel and a third flow-shaping channel, wherein said second flow-shaping channel is in fluid communication with said flow convergence channel, and a coextrusion structure  
15 is formed by said first flow-shaping channel, said second flow-shaping channel, and said flow convergence channel, and said partition member forms a wall portion of said first flow-shaping channel.

17. The apparatus of claim 16, further comprising an  
20 additional partition member, wherein said first flow shaping structure is further partitioned by said additional partition member so as to comprise a fourth flow-shaping channel, said additional partition member being disposed between said third flow-shaping channel and said fourth  
25 flow-shaping channel.

18. The apparatus of claim 16, wherein said coextrusion structure comprises a first flow-shaping insert that comprises a transverse flow-providing portion of said first flow-shaping channel, and said partition member is a  
30 plate, and wherein said first flow-shaping insert and said plate are individually removably disposed within said apparatus.

19. The apparatus of claim 16, further comprising downstream of and in fluid communication with said  
35 coextrusion structure, removably disposed means for

changing the relative orientation of a first flow stream  
and of a second flow stream to one another, comprising  
inlets disposed generally side-by-side to a first flow-  
sequencing channel and a second flow-sequencing channel in  
5 fluid communication with an interface generating channel.

20. The apparatus of claim 19, wherein said inlets are  
disposed coplanar to one another.